

Notice of Allowability**Application No.**

10/539,343

Applicant(s)

DOLLE ET AL.

Examiner

RIP A. LEE

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1796

- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to May 1, 2008.
2. ☒ The allowed claim(s) is/are 15-39.
3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some* c) ☐ None of the:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
(a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
(b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☒ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO/SB/08),
Paper No./Mail Date _____
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application
6. ☒ Interview Summary (PTO-413),
Paper No./Mail Date 08-07-2008.
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____.

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EXAMINER'S AMENDMENT

An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Jarrod N. Raphael on August 7, 2008.

Amendment to claims

Claim 15, line 7 insert “ - a quinacridone pigment” after “230 °C and 5 kg”

Basis for amendment: subject of claims 15 and 36 are internally consistent

Amendment to Abstract

Move entire paragraph 2, which recites,

“The molding compositions of the invention preferably comprise a quinacridone pigment as nucleating agent. The high-molecular-weight propylene polymer used preferably comprises a high-molecular-weight propylene copolymer with up to 30 % by weight of other copolymerized olefins having up to 10 carbon atoms. One of the uses of the molding compositions of the invention is as materials for pipes.”

Immediately after “2 to 20 % by weight” so that the abstract is written as a single paragraph.

Allowable Subject Matter

The following is an examiner's statement of reasons for allowance: Claims 15-39 are allowed over the closest references cited below.

The instant invention is drawn to a thick-walled pipe comprising a diameter of at least 500 mm and a wall thickness of at least 28.4 mm, wherein the thick-walled pipe comprises a molding composition, the molding composition comprising:

- a high molecular weight propylene polymer comprising a melt flow rate MFR (230 °C, 5 kg) of from 0.3 to 1 g/10 min,
- a quinacridone pigment, and
- 2 to 8 % by weight of β -modification crystallites.

Another aspect of the invention is drawn to a process for preparing a said thick-walled pipe comprising mixing the high molecular weight propylene polymer and the quinacridone pigment, melting the high molecular weight propylene polymer and quinacridone pigment to form a quinacridone propylene polymer mixture, and extruding the quinacridon propylene polymer mixture.

Inventive pipes exhibit very smooth internal surface and very good results for circularity and bore thickness distribution while maintaining long term internal hydrostatic pressure (tested by DIN 8078). Pipes fully comply with the requirements of DIN 8077 with respect to dimensional limits for the average external diameter and ovality and the dimensional limit for wall thickness.

The seminal work of Jacoby *et al.* (U.S. 5,310,584) teaches incorporation of the γ -form quinacridone pigment (Q-dye) into polypropylene resin to induce β -spherulite formation in the resin; that is, the pigment serves as nucleating agent to induce crystallization of polypropylene in the beta, or pseudohexagonal, crystal form. The content of β -crystallites is determined by x-ray diffraction methods and characterized empirically with a "K parameter" which varies from 0 (no β -crystallites) to 1 (sample with all β -crystallites). Inventive compositions contain from about 0.1 to about 10 ppm of quinacridone such that the composition exhibit a K value of about 0.3 to

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0.95. As an example, polypropylene having a melt flow rate of 3.01 g/10 min containing 1.0 ppm (0.0001 wt %) of Q-dye exhibits a K value of 0.374. A sample prepared in similar fashion and containing polypropylene (MFR = 3.20) and 1.5 ppm of Q-dye exhibits a K value of 0.489. In another example, a polypropylene resin (MFR = 2.85) containing 2.0 ppm of Q-dye, exhibits a K value of 0.743. For a given method, it appears that β -crystalline content may increase with increasing level of nucleating agent within a certain range.

It is important to note that crystallinity of a sample, while affected by the content and type of nucleating agent, is primarily governed by the method of preparation of the sample. Factors include, rate of cooling of sample and temperature of onset of crystallization. This phenomenon is well known to those having ordinary skill in the art. Naoki *et al.* (EP 962 489) is instructive. The reference compares effects of various β -nucleating agent on the content of β -form content of extruded sheet. In one sample, a composition of propylene homopolymer (MFR = 14 g/10 min) and 0.05 parts by weight of *N,N'*-dicyclohexyl terephthalimide were milled and pelletized; resulting pellets were melted pellets 230 °C for 10 min and compression molded at 60 °C for 5 min to form a 0.5 mm thick sheet. The sheet exhibited a β -form content of 95 %. Another sheet was made under identical conditions except the terephthalimide nucleating agent was replaced with an equivalent amount of γ -quinacridone. The resulting sheet showed only a trace amount of β -form.

As another example, JP 49-98478 discloses an opaque microporous polypropylene film prepared by stretching an isotactic polypropylene resin containing 0.05 % of γ -form quinacridone into a 400 μ m thick sheet and having a β -modification content of 75 %. The sheet was then simultaneously biaxially stretched 300 % at 125° to give a film having a β -modification content of 10 %. In this case, it can be seen that the nucleation and crystallization process which affect the β -modification content is controlled by physical manipulation of the sample.

This particular reference is silent with respect to the melt flow rate of the polymer. The reference neither teaches the composition nor the pipe of the instant claims, and one having ordinary skill in the art would not have found it obvious to use the microporous propylene composition for manufacture of a pipe.

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Helberg *et al.* (EP 278 470) represents the closest art. The patent discloses preparation of polypropylene compositions containing propylene homopolymer or copolymer having a melt index (230 °C, 5 kg) less than 5 g/10 min, preferably less than 2 g/10 min, and 0.001 to 0.5 wt % of various nucleating agents selected from sodium benzoate, aluminum *p*-tert-butylbenzoate, calcium montanate, quinacridone, and talc. Compositions are well-suited for extrusion of plastic profile and pipe. One composition is prepared from polypropylene-ethylene copolymer (5 wt % ethylene) having a melt index of 0.3 g/10 min and 0.001 wt % of quinacridone. The polymer exhibits the claimed lower range of melt index, and the composition contains the lower limit of quinacridone recited in the claims. However, the reference does not teach a composition containing the claimed 2 to 8 wt % of β -modification crystallites. While the content of β -modification crystallites is affected to some extent by the amount and type of nucleating agent, the content of a particular crystalline phase, such as the β -form of polypropylene, also depends on the method of preparation of the sample. Helberg *et al.* is deficient in disclosing experimental details for making the contemplated pipe to lead one of ordinary skill in the art to conclude that the resulting composition inherently and necessarily exhibits the claimed 2 to 8 wt % of β -modification crystallites, and the reference provides no motivation or suggestion to make a composition with this particular β -modification content. Also, the reference does not disclose pipe having the claimed dimensions. Based on these considerations, it is deemed that Helberg *et al.* does not teach or reasonably suggest the pipe described in the present claims.

The following references have been cited to show the state of the art with respect to manufacture of pipe comprising polypropylene resin containing β -modification crystallites.

Konrad *et al.* (WO 99/40151; equivalent U.S. 2003/0008091)

Yoshida *et al.* (EP 660 024)

McGoldrick *et al.* (EP 1 260 545; equivalent U.S. 2004/0157019)

McGoldrick *et al.* (EP 1 260 528; equivalent U.S. 2004/0157969)

McGoldrick *et al.* (EP 1 260 529; equivalent U.S. 2004/0158002)

McGoldrick *et al.* (EP 1 260 546; equivalent U.S. 2004/0170790)

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Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rip A. Lee whose telephone number is (571)272-1104. The examiner can be reached on Monday through Friday from 9:00 AM - 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vasu S. Jagannathan, can be reached at (571)272-1119. The fax phone number for the organization where this application or proceeding is assigned is (571)273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <<http://pair-direct.uspto.gov>>. Should you have questions on the access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll free).

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August 7, 2008

/VASUDEVAN S. JAGANNATHAN/
Supervisory Patent Examiner, Art Unit 1796